

IN THE CLAIMS

1. to 4. (Canceled)

5. (Currently amended) A method of dequeuing a flow from a scheduling queue having an empty indicator, the method comprising:

determining if an empty indicator of a scheduling queue is set to empty wherein the empty indicator is configured to indicate the queue is not empty when a flow is attached or reattached to the queue;

searching the scheduling queue if the empty indicator indicates that a flow is associated with the scheduling queue is set to empty;

determining if the scheduling queue is empty based on the search;

setting the empty indicator to empty if the search determines that the scheduling queue is empty;

finding a flow attached to the scheduling queue if the search does not determine that the queue is empty;

determining whether a higher priority flow preempts servicing of the flow attached to the scheduling queue; and

detaching the flow associated with the scheduling queue found when the scheduling queue is searched wherein the detached flow is a winning flow.

6. (Previously presented) The method of claim 5, further comprising selecting the scheduling queue from among a plurality of scheduling queues in a round robin process.

7. (Original) The method of claim 5, wherein the searching step includes searching a plurality of subqueues included in the scheduling queue, the subqueues having mutually different respective ranges and resolutions.

8. (Canceled)

9. (Previously presented) The method as recited in claim 5, further comprising:

attaching a flow to the scheduling queue; and

placing the empty indicator associated with the scheduling queue in a condition to indicate that the scheduling queue is not empty.

10. (Original) The method of claim 9, wherein the attaching step includes assigning the flow to a slot in the scheduling queue according to the formula $CP + ((WF \times FS)/SF)$, where: CP is a pointer that indicates a current position in the scheduling queue;

WF is a weighting factor associated with the flow;

FS is a size of a data frame associated with the flow;

and

SF is a scaling factor.

11. (Original) The method of claim 9, wherein the placing step includes setting a bit in a register.

12. (Original) The method of claim 9, wherein the placing step includes resetting a bit in a register.

13. to 16. (Canceled)

17. (Previously presented) The method of claim 5, wherein, if the detaching step is performed, a further search of the scheduling queue is performed to determine whether any flows are enqueued in the scheduling queue other than the flow detached in the detaching step.

18. (Original) The method of claim 17, wherein the empty indicator is placed in a condition to indicate that the scheduling queue is empty if the further search of the scheduling queue determines that there are no flows in the scheduling queue other than the flow detached in the detaching step.

19. (Currently amended) A scheduler for a network processor, comprising:

one or more scheduling queues, each adapted to define a respective sequence in which flows are to be serviced; and

a plurality of empty indicators, each empty indicator of the plurality of empty indicators being associated with a respective scheduling queue to indicate whether the respective scheduling queue is empty;

wherein the scheduler is adapted to:

determine if an empty indicator of the plurality of empty indicators is set to empty wherein the empty indicator is configured to indicate the queue is not empty when a flow is attached or reattached to the respective scheduling queue;

search the scheduling queue if the empty indicator indicates that a flow is associated with the scheduling queue;

determine if the scheduling queue is empty based on the search;

set the empty indicator to empty if the search determines that the scheduling queue is empty;

finding a flow attached to the scheduling queue if the search does not determine the the scheduling queue is empty;

determining whether a higher priority flow preempts servicing of the found flow; and

detach the flow associated with the scheduling queue found during the search wherein the detached flow is found when the scheduling queue is searched a winning flow.

20. (Canceled)

21. (Canceled)

22. (Currently amended) A computer program product adapted to dequeue a flow from a scheduling queue, the computer program product comprising:

a medium readable by a computer, the computer readable medium having computer program code adapted to:

determine if an empty indicator is set to empty;

search the scheduling queue if the empty indicator indicates that a flow is associated with the scheduling queue wherein the empty indicator is configured to indicate the queue is not empty when a flow is attached or reattached to the respective scheduling queue;

determine if the scheduling queue is empty based on the search;

set the empty indicator to empty if the search determines that the scheduling queue is empty;

find a flow that is attached to the scheduling queue if the search determines that the scheduling queue is not empty;

determine whether a higher priority flow preempts servicing of the flow found during the search; and

detach the flow found during the search associated with from the scheduling queue wherein the detached flow is found when the scheduling queue is searched the winning flow.

23. (Canceled)

24. (Canceled)

25. (Currently amended) A method of enqueueing a flow to a scheduling queue, comprising:

placing an empty indicator associated with the scheduling queue in a condition to indicate the scheduling queue is not empty wherein the empty indicator is:

one of a plurality of empty indicators; and

configured to indicate the queue is not empty when a flow is attached or reattached to the respective scheduling queue;

attaching a flow to the scheduling queue; and

placing an empty indicator of a plurality of empty indicators associated with the scheduling queue in a condition to indicate that the scheduling queue is not empty;

wherein placing the empty indicator in the condition to indicate the scheduling queue is not empty is performed due to attaching the flow to the scheduling queue; and

wherein the attaching step includes assigning the flow to a slot in the scheduling queue according to the formula $CP + ((WF \times FS)/SF)$, where:

CP is a pointer that indicates a current position in the scheduling queue;

WF is a weighting factor associated with the flow; FS is a size of a data frame associated with the flow; and SF is a scaling factor.